Humane Trapping Program
Annual Report 1990/91

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RESEARCH
COUNCIL Forestry

Humane Trapping Program
Annual Report
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by

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Summary

In July 1990, the Research and Conservation Committee of the Fur Institute of Canada identified priorities for the 1990-91 humane trapping research program of the Alberta Research Council. The objectives of this program were to: (1) develop and test trapping devices for red squirrel, lynx and raccoon, in simulated natural environments; (2) field test potentially humane traps for arctic fox, marten, and raccoon; (3) evaluate mechanically all trapping devices; (4) transfer trap technology to industry; (5) support the writing of trap standards; (6) conduct a fisher ecological study in central Alberta; (7) draft a fur leaflet; and (8) analyze and publish research data.

In 1990-91, the Wildlife Section of the Alberta Research Council met all the objectives of the humane trapping program and produced the following results:

- Development of a humane killing trap for red squirrel: a modified Kania trap.
- Development of a humane killing trap for lynx: a modified Conibear 330 trap.
- Development of a trigger for the Sauvageau 2001-8 trap to consistently strike raccoons in the head-neck region. However, the trap failed to render immobilized raccoons irreversibly unconscious within three minutes.
- Field testing of the Sauvageau 2001-8 trap for arctic fox.
- Field testing of the EGG trap for raccoon.
- Field testing of the Kania trap for marten.
- Mechanical evaluation of 21 trap prototypes.
- Completion of the Conibear 220 trap life expectancy study.
- Testing of three devices to safely handle rotating-jaw traps while setting them.
- Development of portable pliers to free anyone inadvertently caught in rotating-jaw traps.
- Improvement of the Bionic trap design for manufacture.
- Transfer of technology (the C120 Magnum with pitchfork trigger for marten and with pan trigger for mink) to manufacturers.
- Participation in the writing of national and international trap standards.
- Monitoring of fishers reintroduced to the Parklands of central Alberta.
- Drafting of a fur leaflet.
- Seven media interviews and four organized tours of the research facilities.
- 17 publications and 17 reports.
- 12 conferences.

Introduction

Since 1989, the Wildlife Section of the Alberta Research Council has been involved in the development of humane trapping devices, a program funded by the Fur Institute of Canada, Environment Canada, International Fur Trade Federation, Alberta Fish and Wildlife, Alberta Agriculture, and the Council itself. In 1989-90, the Wildlife Section produced three humane trapping systems for arctic fox (*Alopex lagopus*), marten (*Martes americana*), and raccoon (*Procyon lotor*), completed the mechanical evaluation of several trap prototypes, transferred new technology to industry, and reintroduced fishers (*Martes pennanti*) in central Alberta.

In July 1990, the Research and Conservation Committee of the Fur Institute of Canada identified research priorities for the 1990-91 humane trapping program. The Wildlife Section pursued these priorities through its research activities in its facilities at Edmonton and Vegreville, Alberta, and on traplines in British Columbia, New Brunswick, the Northwest Territories, and Quebec. This report reviews the progress accomplished during the 1990-91 humane trapping program. The success of this program rested on the tremendous effort of the professionals and technologists at Alberta Research Council, and the contributions of inventors, trappers, manufacturers, biologists, veterinarians, government officials, politicians, and many other individuals.

Priorities and Objectives

The Research and Conservation Committee of the Fur Institute of Canada identified the 1990-91 research priorities. The work carried out at the Alberta Research Council was first reviewed and endorsed by the Animal Care Committee of the humane trapping program.

Priorities	Objectives
Compound Work (Vegreville)	
1. Red Squirrel ***(Tamiasciurus hudsonicus)***	• Evaluate the mechanical characteristics of the Kania killing trap. • Develop a trapping system (i.e. trigger and set) that will ensure head-neck strikes. • Assess the ability of the Kania trap to humanely kill red squirrels. • Develop a small power snare. • Compare this power snare to a manual snare. • Assess the ability of this power snare to humanely kill red squirrels.
2. Lynx (*Felis lynx*)	• Develop a trapping system that will ensure head-neck strikes in a Conibear 330 trap equipped with two clamping bars. • Assess the ability of this modified Conibear 330 trap to humanely kill lynx. • Assess the ability of the standard Conibear 330 trap (no clamping bars) to humanely kill lynx immobilized with Ketamine HCl. • If time and resources permit it, assess the ability of the Sauvageau 2001-8 trap and/or the Olecko power snare to capture lynx in the head-neck region and humanely kill them.
3. Raccoon	• Develop a trapping system to capture raccoons in the head-neck region with the Sauvageau 2001-8 trap. • Assess the ability of the Sauvageau 2001-8 trap to humanely kill raccoons.
Trapline Work	
1. Arctic fox	• Verify the strike locations and the killing ability of the Sauvageau 2001-8 trap in the Northwest Territories. • Compare the capture efficiency of the Sauvageau 2001-8 trap to that of trapping devices commonly used by participating trappers.
2. Marten	• Verify the strike locations and the killing ability of the Kania trap in New Brunswick and the Northwest Territories. • Compare the capture efficiency of the Kania trap to that of trapping devices commonly used by participating trappers.
3. Raccoon	• Determine the type and rated magnitude of limb injuries of raccoons held in the EGG trap for 24 hours or less in Quebec and British Columbia. • Compare the capture efficiency of the EGG trap to that of trapping devices commonly used by participating trappers.
Laboratory Work	
1. Mechanical Evaluation	• Test trap models used in the trapline work. • Test the 3M trap for muskrat (*Ondatra zibethicus*). • Test diverse foothold traps for wolf (*Canis lupus*). • Test snares and the Kania trap for red squirrels. • Test other trapping devices submitted by the Fur Institute of Canada.
2. Trap Life Expectancy	• Complete the trap life expectancy study with the Conibear 220 trap.
3. Safety Devices	• Develop/test devices to safely set a trap and to free a trapper.

Trap Manufacture

1. Bionic Trap	• Produce 100 Bionic traps with an improved design.
2. C120 Magnum Trap	• Assist manufacturers interested in the production of the C120 Magnum trap.
3. Pan trigger for mink	• Transfer the design of the C120 Magnum trap with pan trigger for mink (*Mustela vison*) to industry.
Standards	• Provide advice to the committees involved in the writing of standards.
Fisher Ecological Study	• Continue to monitor the movements of reintroduced fishers to determine the characteristics of their seasonal home ranges.

Public Relations

1. Fur Leaflet	• Produce a leaflet that will review the Fur Institute of Canada's efforts to produce humane traps.
2. Media	• Participate in media interviews.
Analysis and Publication of Data	• Analyze and publish previous and current research data (e.g., Alberta Environmental Centre/1985-89 and Alberta Research Council/1989-91).

Methods

The mechanical evaluation of trap prototypes involved the determination of average trap momentum and clamping forces at diverse openings. The values were compared to kill threshold values (minimum striking and clamping forces required to render a species irreversibly unconscious within three minutes) reported by the Canadian General Standards Board. According to their position on kill threshold graphs, traps were rejected or recommended for further testing.

Animal-based studies were conducted in Vegreville simulated natural environments and involved a series of sequential tests. A killing device was considered to be humane if it could be expected, at a 95% level of confidence, to render >79% of target animals irreversibly unconscious within three minutes. To meet that standard, a trap must: 1) rate mechanically above the kill threshold of the Canadian General Standards Board; 2) strike $\geq$5/6 animals in vital regions (approach tests); 3) render $\geq$5/6 animals immobilized with ketamine HCl irreversibly unconscious within three minutes (pre-selection tests); and 4) pass kill tests in enclosures by rendering 9/9 (or 13/14, or 18/20,...) animals irreversibly unconscious within three minutes (kill and performance confirmation tests).

All field testing involved professional trappers accompanied by wildlife technicians. Experimental killing traps were found humane if >79% of target animals were struck in vital regions and sustained trauma similar to those observed in simulated natural environments. Live-holding devices were equipped with monitoring clocks to determine the time and duration of capture. They were found humane if they held >79% of target animals for $\leq$24 hours without serious injury (e.g., luxation, fracture, amputation, etc.).

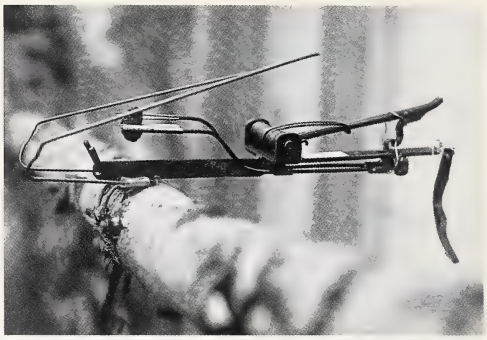
Compound Work

Red Squirrel

The Kania trap for red squirrel is a narrow mousetrap with high energies (average momentum: 1.0754 kg m/sec; range of clamping forces: 17.0 - 24.6 N). The trap is set perpendicular to a running pole and when an animal steps on the trigger that lays over the pole, it is struck by a jaw closing 180° on another fixed jaw. Approach studies showed that red squirrels could frequently run on the pole without being captured, even when a wire loop was placed in front of the trap to force the animals to break their stride and step on the trigger. Also, the squirrels moved so fast that the trap could not consistently strike them in the head-neck region.

Extensive modifications were made to the inventor's recommended set and original design. To break the animal's stride, the trigger was baited with a pine cone (a bait that will not attract carnivores). To stretch the animal's body and position the head-neck region in line with the striking bar, wings made out of wire were added to the sides of the trap. With these modifications, the trap passed the approach tests.

In the pre-selection tests, the squirrels were placed in the trap in a position that duplicated placement in the approach tests. All the animals sustained major trauma to the skeleton



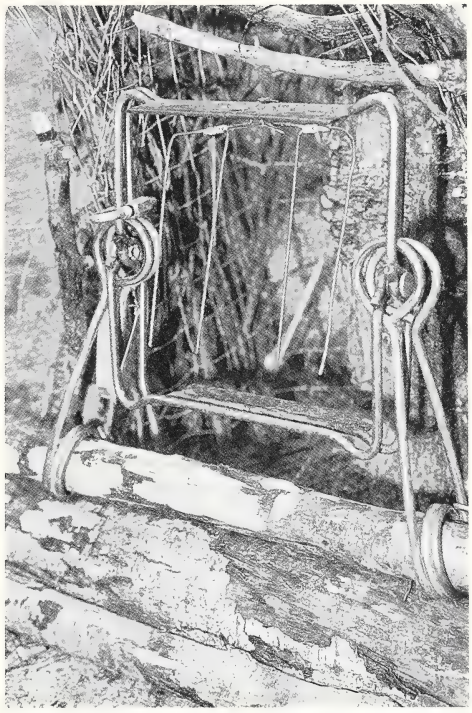
and central nervous system, and lost consciousness within three minutes.

The trap passed the kill tests. It rendered 9/9 red squirrels irreversibly unconscious within three minutes. On the basis of the compound research work, the modified Kania trap can be expected to render >79% of red squirrels captured on traplines irreversibly unconscious within three minutes. The trap is now eligible for field testing.

The Wildlife Section also developed a small power snare with a modified Conibear 120 spring. This device still requires testing in the laboratory and in simulated natural environments.

Lynx

A Conibear 330 trap with a regular two-prong trigger and two clamping bars (one bar welded on each jaw of a same frame), was set approximately 23 cm from the ground in a natural cubby. The trap could not consistently strike the animals in the head-neck region and was further modified. It was equipped with a one-way trigger with four prongs (the centre



prongs were 75 mm apart; the outside prongs were kept equidistant from the centre ones and the trap frame) and set in a portable cubby made of branches woven in a wire mesh. The trap passed the approach tests. In the pre-selection tests, all the lynx irreversibly lost consciousness within three minutes. In the kill tests, the trap rendered 9/9 lynx struck in the head-neck region irreversibly unconscious within three minutes. On the basis of the compound research work, this modified Conibear 330 trap can be expected to render >79% of lynx captured on traplines irreversibly unconscious within three minutes. It is now eligible for field testing.

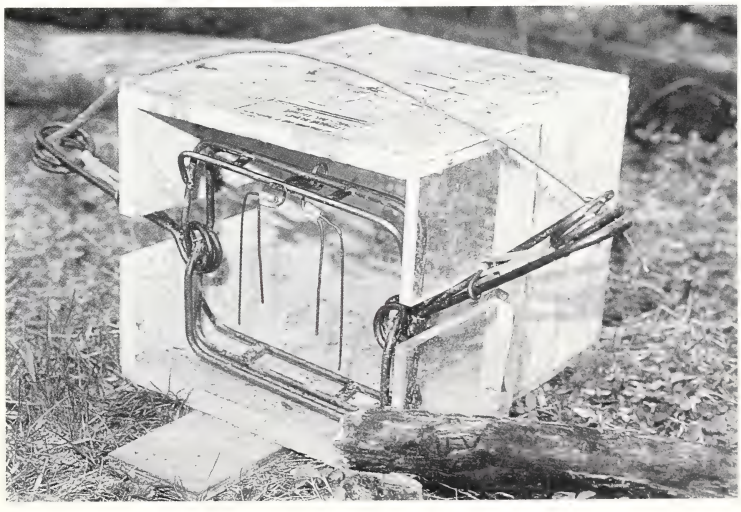
The Wildlife Section also tested the standard Conibear 330 trap (no clamping bars) in pre-selection tests. The trap passed the tests and is now eligible for kill tests in simulated natural environments.

Raccoon

Previous research work at the Vegreville compound showed that it was difficult to properly strike raccoon in rotating-jaw traps: either the animals used their paws to fire the trap or they walked into the trap and their legs interfered with the closing of the jaws.

The Sauvageau 2001-8 trap was selected as a potential rotating-jaw killing device because it rated above the kill threshold and was significantly more powerful than the commonly used Conibear 220 trap. It was equipped with a one-way pitchfork trigger (the centre prongs were 70 mm apart; the outside prongs were equidistant from the centre ones and the trap frame) and set in a ground cubby box. A bait was thinly spread just behind the trap, on the floor of the cubby box. The animals could not remove the bait with their paws; when they licked it, they fired the trap with their forehead. The trap passed the approach tests. Raccoons were struck in the head-neck region. In some cases, their paws rested on the striking jaw of the trap but could not interfere with its closing.

The Sauvageau 2001-8 trap failed the pre-selection tests because two (one animal was struck behind the head and the other, on the forehead) of three raccoons did not lose consciousness within three minutes and were subsequently euthanized. The trap's impact and clamping energies should be enhanced before more testing with animals.



Trapline Work

Arctic Fox

The Sauvageau 2001-8 trap set with a baited offset trigger in a cubby was tested in the Northwest Territories on one trapline on Banks Island, near Sachs Harbor, and on one trapline on Victoria Island, near Holman. A total of 220 arctic foxes were captured:

- Sachs Harbor - 115 foxes:
  - 96 in No. 1-1/2 leghold trap.
  - 19 in Sauvageau 2001-8 trap.
- Holman - 105 foxes:
  - 57 in No. 1-1/2 leghold trap.
  - 48 in Sauvageau 2001-8 trap.

All the animals captured in the Sauvageau trap were struck in the head-neck region as was expected from the 1989-90 compound work. Necropsies of the carcasses are currently under way.

There was a marked difference in the capture efficiency of the Sauvageau trap from one trapline to the other. In Sachs Harbor, the testing period was November 10-18, 1990. In Holman, testing began in late November and ended in mid-January 1991. The traps used on the Holman trapline faced the prevailing wind and were more weathered. These set differences, and the fact that arctic foxes may be more easily enticed into a killing trap later in the trapping season could explain the greater number of Sauvageau captures in Holman.

Marten

The Kania trap for marten was tested on one trapline northwest of Bathurst, New Brunswick, and on one trapline west of Fort Norman, Northwest Territories. A total of 119 martens were captured:

- Fort Norman - 69 martens:
  - 47 in control traps (Nos. 0 and 1 leghold traps).
  - 22 in the Kania trap.
- Bathurst - 50 martens:
  - 37 in control traps (Conibear Nos. 110, 120, and 160).
  - 13 in the Kania trap.

On the Fort Norman trapline, all the martens received head-neck strikes similar to those in simulated natural environments. One animal succeeded in pulling the trap off the tree before dying. It appears that the Kania trap rendered >79% of Fort Norman martens irreversibly unconscious within three minutes.

On the Bathurst trapline, two martens were struck in the shoulders and two more pulled the trap off the tree before dying. Shoulder

strikes were not observed during the 1989-90 compound work but were expected in the field because of the acrobatic behavior of martens exploring the trap cubby. While autopsy data have not yet been analyzed, these trapline results suggest that the Kania trap may have failed to render >79% of martens irreversibly unconscious within three minutes.

On both traplines, the Kania trap was markedly less capture-efficient than the control traps. Because the bait is placed at the back of a totally enclosed cubby, it may not succeed in attracting martens to the trap set.

The cubby of the Kania trap could be modified to: (1) enhance the release of bait scent; (2) prevent animals entering too far and being struck in the shoulders; and (3) ensure that the trap remains fastened to the tree. Because of the discrepancy in the humaneness assessment of the Kania trap from one trapline to the other, and the reduced capture-efficiency observed on both traplines, it is recommended that the Kania trap be equipped with a modified cubby and be further tested on traplines.

■ Raccoon

The EGG trap was tested near Hull, Quebec and in Vancouver, British Columbia. A total of 251 raccoons were captured:

- Hull - 187 raccoons:
  - 117 in the Conibear 220 trap.
  - 70 in the EGG trap.
- Vancouver - 64 raccoons:
  - 36 in box traps.
  - 28 in the EGG trap.

On the basis of preliminary necropsy reports and data analyses, it appears that the EGG trap has the capability to hold >79% of raccoons for ≤24 hours without serious injury. At the beginning of the trapline work, the EGG trap was as capture-efficient as the Conibear 220 trap. Later in the season, when the raccoons were fatter and possibly less inquisitive in their search for food, the EGG trap's efficiency dropped. In British Columbia, the experimental and control traps had similar efficiencies. Contrary to box traps, the EGG trap was more easily concealed and captured only raccoons.

Laboratory Work

Mechanical Evaluation

Several trap prototypes were mechanically tested:

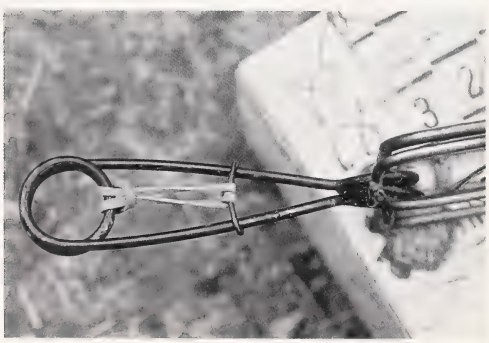
1. Sauvageau 2001-8 trap model used on traplines.
2. Marten Kania trap model used on traplines.
3. EGG trap model used on traplines.
4. Bionic prototype produced by Anderson Assoc. Ltd.
5. C120 Magnum prototype produced by Mr. Larabie (LDL Co.) - three generations.
6. C120 Magnum prototype produced by Economy Metal Works Ltd. - three generations.
7. LDL Special.
8. Squirrel Kania trap.
9. Muskrat Kania trap.
10. Marten Kania trap (a mousetrap type).
11. 3M trap produced by Mr. Robertson.
12. 6 Wolf leghold traps.

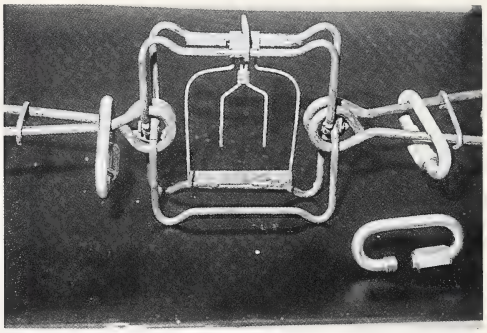
Trap Life Expectancy

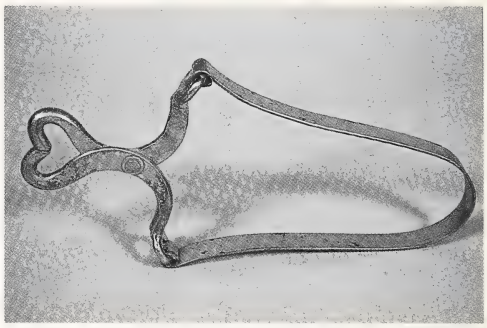
The study of the life expectancy of the Conibear 220 trap was pursued and completed in June 1991. Data are being analyzed.

Safety Devices

Several devices/gadgets were identified to safely handle rotating-jaw traps while setting them and to free trappers inadvertently caught:







1. Regular safety hooks with an elastic band *(left)*. These hooks keep the springs cocked.
2. Quick-links to keep the springs cocked *(top right)*.
3. Pliers *(above)* manufactured by Mr. N. Gravel (Chutes-aux-Outardes, Quebec). They can prevent any type of rotating-jaw trap from closing.
4. Portable prying tool developed by head technologist A. Kolenosky and welder H. Schultz. This portable tool forces open the eyes of any rotating-jaw trap spring.

Trap Manufacture

Bionic Trap

Anderson Associates Consulting Engineers Inc. (Edmonton, Alberta) were contracted to improve the design of the Bionic trap and produce 100 prototypes to be used on traplines. A simplified trap design with mechanical values similar to those of the original prototype tested in Vegreville, will be recommended for manufacture.

C120 Magnum

The C120 Magnum is manufactured and sold by Les Pieges du Quebec Enr. (St-Hyacinthe, Quebec). However, considerable time was spent on the testing and development of C120 Magnum traps produced by other manufacturers. Marketable products are anticipated to be available in the near future.

Pan Trigger for Mink

A C120 Magnum trap with pan trigger was sent to Mr. Sauvageau (Les Pieges du Quebec Enr.). A marketable product is being developed.

Standards

The Wildlife Section participated in committees writing national and international trap standards.

Public Relations

Fur Leaflet

The Wildlife Section drafted a fur leaflet[1] that described the series of sequential tests used in trap development and listed the traps determined to be humane.

Media

The Wildlife Section participated in the following media interviews:

1990

28 July – Edmonton Journal
Subject: Russian delegation toured the humane trapping research facilities.

13 Aug. – CBC - Edmonton
Subject: The fisher release program.

15 Aug. – CBC - Calgary
Subject: The fisher release program.

2 Nov. – CTV - "W5"
Subject: The humane trapping research program.

9 Nov. – CBC - Inuvik
Subject: Arctic fox trapping.

27 Nov. – Western Sportsman
Article: "Hard times on the trapline" by D. Elasser, Feb./Mar. 1991.

1991

5 May – National Forest Week
Article: "Have you seen a fisher lately?"

Tours

The following people/organizations toured the humane trapping research facilities:

1990

July – Russian delegation.

Nov. – Swedish Environmental Protection Agency and the National Association of Huntsmen.

1991

March – Participants of the 56th North American Wildlife and Natural Resources Conference held in Edmonton.

May – Department of Forestry, Alberta Research Council.

Fisher Ecological Study

In an effort to reintroduce fisher in the Parklands of central Alberta, nine adults (three males and six females) were released in March, and eight more (three males and five females) in June 1990. During the month following their release, the March animals moved extensively and were found 10 to 70 km away from their release sites. Three of them lost their radio-collars and four more died because of intraspecific fight wounds and trauma of unknown origin, predation by a bird of prey, and roadkill. The fishers released in June adapted to their new environment and a month later were found 1 to 16 km away from their release sites. One of them lost its collar but none were killed.

In 1990-91, the movements of the animals were closely monitored. Fishers restricted their activities to continuous deciduous forest stands adjacent to wetlands and grasslands. In spring 1991, a recapture program was initi-

[1] The Fur Insatitute of Canada used sections of this leaflet to produce a final publication.

ated and the collars of six females were refurbished. Unfortunately, the radio-collar of one male broke down and its actual location is unknown. One female was killed by a large dog and a male died of massive trauma likely caused by a vehicle. Before its death, this male was in proximity of females and may have bred. The movements and activities of five females are still being monitored.

This study indicates that fishers released in June are more likely to settle in the vicinity of their release sites than those released in March. A considerable amount of information about to the adaptability and needs of the fishers remains to be analyzed. However, it is apparent that fishers can take advantage of mosaics of deciduous forests, pastures, farmlands, and wetlands.

Publications and Conferences

Refereed Publications

Hobson, D. P., G. Proulx, and B. L. Dew. 1989. Initial post-release behavior of marten, *Martes americana*, introduced in Cypress Hills Provincial Park, Saskatchewan. Canadian Field-Naturalist 103: 398-400. (This scientific issue was released in August 1990.)

Proulx, G., and M. W. Barrett. 1991. Evaluation of the Bionic trap to quickly kill mink (*Mustela vison*) in simulated natural environments. Journal of Wildlife Diseases 27:276-280.

Proulx, G., and M. W. Barrett. 1991. Ideological conflict between animal rightists and wildlife professionals over trapping wild furbearers. North American Wildlife and Natural Resources Conference 56: 387-399.

Proulx, G., and M. W. Barrett. 1991. Ethical considerations in the selection of traps to harvest marten and fisher. *In* S. W. Buskirk, A. Harestad, M. G. Raphael, and R. A. Powell, eds. *Martes*: Accepted for publication.

Proulx, G., M. W. Barrett, and S. R. Cook. 1990. The C120 Magnum with pan trigger: a humane trap for mink (*Mustela vison*). Journal of Wildlife Diseases 26:515-517.

Proulx, G., A. Kolenosky, M. Badry, R. Drescher, K. Seidel, and P. Cole. 1991. Post-release movements of fishers reintroduced in March and June in the Parklands of central Alberta. *In* S. W. Buskirk, A. Harestad, M. G. Raphael, and R. A. Powell, eds. *Martes*: Accepted for publication.

Non-Refereed Publications

Cole, P., and G. Proulx. 1991. The care of mustelids in experimental research. Abstract. 9th Midwest Furbearer Workshop, 15-19 Apr., Custer, South Dakota.

Kolenosky, A., and G. Proulx. 1991. Radiotracking fisher in the Parklands of Alberta. Abstract. 9th Midwest Furbearer

Workshop, 15-19 Apr., Custer, South Dakota.

Proulx, G. 1990. New developments in humane traps and trapping methods. Abstract. Symposium Managing Predation to Increase Production of Wetland Birds, 15-17 Aug., Jamestown, North Dakota: 11-12.

Proulx, G. 1990. The 1989-90 humane trapping program: successful year for Alberta Research Council. The Trapper, June/July, 4(5): 4-5.

Proulx, G. 1990. Humane trapping program: highlights 1989-90. The New B.C. Trapper, Fall issue 1(1): 19.

Proulx, G. 1991. The Alberta SPCA's policy on trapping is misleading the public. Alberta Wildlifer 2(1): 5.

Proulx, G. 1991. Humane trapping devices: what we have and what we need. Abstract. 9th Midwest Furbearer Workshop, 15-19 Apr., Custer, South Dakota.

Proulx, G. 1991. Significant developments in humane trapping research. The Alberta Game Warden, Spring 1991, 3(2):18-19.

Proulx, G. 1991. Trapping wild furbearers - Is there a future? Extended Abstract Volume, International Symposium on Cold Region Development '91, 16-21 June, Edmonton, Alberta: 19.

Proulx, G., and M. W. Barrett. 1991. Managerial and ethical considerations in the selection of traps to harvest marten and fisher. Abstract. Symposium Biology and Management of Martens and Fishers, 29 May - 1 June, University of Wyoming, Laramie.

Proulx, G., A. Kolenosky, M. Badry, R, Drescher, K. Seidel, and P. Cole. 1991. Reintroduction of fishers in the Parklands of central Alberta. Abstract. Symposium Biology and Management of Martens and Fishers, 29 May - 1 June, University of Wyoming, Laramie.

■ Unpublished Reports

The Wildlife Section submitted four progress reports to the Research and Conservation Committee of the Fur Institute of Canada, and two reports to the Animal Care Committee. The following reports were also produced:

Badry, M. 1991. Field testing of the Sauvageau 2001-8 for arctic fox. Unpublished report, Alberta Research Council, Edmonton, 6 pp.

Drescher, R. 1991. Mechanical evaluation of the ARC91-2 Bionic prototype. Unpublished report, Alberta Research Council, Edmonton, 16 pp.

Drescher, R. 1991. Mechanical evaluation of a C120 Magnum prototype - ARC90-22. Unpublished report, Alberta Research Council, Edmonton, 10 pp.

Drescher, R. 1991. Mechanical evaluation of a C120 Magnum prototype - ARC90-15. Unpublished report, Alberta Research Council, Edmonton, 9 pp.

Drescher, R. 1991. Mechanical evaluation of the Sauvageau 2001-8 trap: trapline prototype ARC90-23. Unpublished report, Alberta Research Council, Edmonton, 9 pp.

Drescher, R. 1991. Field testing of the Kania trap for marten. Unpublished report, Alberta Research Council, Edmonton, 6 pp.

Drescher, R. 1991. Mechanical evaluation of the C120 Magnum prototypes ARC90-21A, 21B. Unpublished report, Alberta Research Council, Edmonton, 12 pp.

Drescher, R. 1991. Mechanical evaluation of the EGG trap - trapline prototype ARC90-20. Unpublished report, Alberta Research Council, Edmonton, 6 pp.

Drescher, R. 1991. Mechanical evaluation of the B. C. Indian produced Kaniaplate trapline prototype ARC90-19. Unpublished report, Alberta Research Council, Edmonton, 9 pp.

Drescher, R. 1991. Mechanical evaluation of a C120 Magnum prototype ARC91-13. Unpublished report, Alberta Research Council, Edmonton, 8 pp.

Drescher, R. 1991. Mechanical evaluation of the ARC90-16 Kania squirrel trap. Un-

published report, Alberta Research Council, Edmonton, 7 pp.

Drescher, R. 1991. Mechanical evaluation of the Kania ARC90-17 and ARC90-18 traps. Unpublished report, Alberta Research Council, Edmonton, 10 pp.

Drescher, R. 1991. Mechanical evaluation of a C120 Magnum prototype ARC91-5. Unpublished report, Alberta Research Council, Edmonton, 11 pp.

Drescher, R. 1991. An evaluation of the LDL special spring cocking forces. Unpublished report, Alberta Research Council, Edmonton, 3 pp.

Drescher, R. 1991. Mechanical evaluation of the Triple M trap ARC91-6. Unpublished report, Alberta Research Council, Edmonton, 8 pp.

Drescher, R. 1991. Mechanical evaluation of Wolf traps ARC91-7 to ARC91-12. Unpublished report, Alberta Research Council, Edmonton, 23 pp.

Seidel, K. 1991. Field testing the Sauvageau 2001-8 trap for arctic fox - Walker Bay, N.W.T. Unpublished report, Alberta Research Council, 9 pp.

Conferences

1990

16 Aug. – Proulx, G. - New development in humane traps and trapping methods. Symposium Managing Predation to Increase Production of Wetland Birds, Jamestown, North Dakota (presented by R. Drescher).

15 Nov. – Proulx, G. - Review of the Vegreville humane trapping program. Alberta Agriculture, Longman Building, Edmonton.

1991

11 Jan. – Kolenosky, A., R. Drescher, and D. Berndt - Live-trapping raccoon. Alberta Agriculture Pest Controllers, Lethbridge.

15 Jan. – Proulx, G. - Update on humane trapping research. Rocky Mountain House Trappers Association, Rocky Mountain, Alberta.

20 Mar.Proulx, G. - Humane trapping progress. Agriculture Pest Control Clinic, Turner Valley, Alberta.

26 Mar. – Proulx, G. - Ideological conflict between animal rightists and wildlife professionals over trapping wild furbearers. 56th North American Wildlife and Natural Resources Conference, Edmonton, Alberta.

16 Apr. – Kolenosky, A. - Radio tracking fishers in the Parklands of Alberta. 9th Midwest Furbearer Workshop, Custer, South Dakota.

17 Apr. – Cole, P. - The care of mustelids in experimental research. 9th Midwest Furbearer Workshop, Custer, South Dakota.
Proulx, G. - Humane trapping devices: what we have and what we need. 9th Midwest Furbearer Workshop, Custer, South Dakota.

31 May – Proulx, G. - Managerial and ethical considerations in the selection of traps to harvest marten and fisher. Symposium on the Biology and Management of Martens and Fishers, University of Wyoming, Laramie.
Proulx, G. - Reintroduction of fishers in the Parklands of central Alberta. Symposium on the Biology and Management of Martens and Fishers, University of Wyoming, Laramie.

17 June – Proulx, G. - Trapping wild furbearers - Is there a future? International Symposium on Cold Region Development, Edmonton, Alberta. (presented by M. Badry).

Expenditures and Contributions

Expenditures

	Budget	Actual
Manpower	$575,000	$575,000
Supplies and Services	264,955	294,955
Contingency	25,045	25,045
Pathological Evaluations	13,580	13,580
Total	**$878,580**	**$908,580**

Contributions

Fur Institute of Canada	$675,000	$675,000
Alberta Fish and Wildlife	75,000	75,000
Alberta Research Council	115,000	145,000
Alberta Agriculture	13,580	13,580
Total	**$878,580**	**$908,580**

Professional and Technical Staff

Head, Forestry Department: P.C. Williams, M.Sc. (Aston)

Administrative Assistant: L. Cardwell

Manager, Wildlife Section: G. Proulx, Ph.D. (Guelph)

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Secretary: P.S. Grey